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Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Director

## Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on February 15, 2006

### Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts for the Yuma and Phoenix areas as part of the Natural Events Action Plan for these areas. On Monday February 13, 2006, ADEQ air quality forecasters issued the Maricopa County Dust Control Action forecast calling for a high risk of exceeding the PM<sub>10</sub> NAAQS in the Phoenix Metro area for Wednesday February 15<sup>th</sup>. The forecast discussion mentioned the likelihood of significant winds and the possibility of blowing dust throughout the region. In addition to this forecast, a High Pollution Advisory was also issued for the Phoenix Metropolitan area for Wednesday February 15<sup>th</sup> in anticipation of strong winds capable of transporting coarse particulate matter. The forecasts/advisories satisfy the requirement in 40 CFR 51.920(a)(1).

During the early morning hours of the 15<sup>th</sup>, a positively tilted trough was situated near the California / Oregon border with a tight pressure gradient in place near the southeastern quadrant. As the trough of low pressure advanced southeast toward the State, westerly winds veered to the southwest and began to increase. While the Phoenix Metro area was most impacted by blowing dust associated with the strong and gusty SW winds ahead of the frontal boundary, blowing dust in Yuma was attributed to the WNW winds associated with a cold frontal passage. For this reason, highest hourly measurements of PM<sub>10</sub> occurred first in Phoenix, and were then followed by elevated PM<sub>10</sub> values in the Yuma area. The event brought significant wind and elevated ambient concentrations of PM<sub>10</sub> that exceeded the National Ambient Air Quality Standards

(NAAQS) at the ADEQ Yuma Courthouse and Mexico Supersite continuous BAMS monitors. The fact that ambient concentrations exceed the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event "affects air quality."

The high winds and blowing dust were a region-wide event that not only affected the Phoenix and Yuma Metro areas, but also affected numerous locations in southeastern California. NWS data from the Imperial County Airport indicate high winds throughout the day, with haze being reported for over seven hours with visibilities reducing to 1 ¼ miles. Similar reports came from El Centro, California, where winds gusted to 50 mph, blowing dust was reported for over 12 hours, and visibility was reduced to one mile. As evidenced by the strong winds and elevated PM<sub>10</sub>, these weather conditions also persisted throughout the day in the Yuma and Phoenix metro areas. Blowing dust was reported at the Yuma Marine Corp Air Station (MCAS) for numerous hours during the evening of the 15<sup>th</sup> (see attachments). All appropriate state implementation plan (SIP) control measures were in place during the event demonstrating, per 40 CFR 50.1(j), that the event "is not reasonably controllable or preventable."

Elevated PM<sub>10</sub> concentrations were measured in the Yuma and Phoenix areas on February 15<sup>th</sup>. However, we are only requesting that the exceedances from the Yuma area monitors be flagged and excluded from regulatory analyses. The following are the key PM<sub>10</sub> monitor readings for the monitors examined in this report:

Monitor (Operator/Type)	AQS ID *	24-hr Avg PM <sub>10</sub>	1-hr Max PM <sub>10</sub>	Time of Max 1-hr	Flag **
<b>YUMA AREA</b>					
<b>Yuma Courthouse (ADEQ/BAM)</b>	<b>04-027-0004</b>	<b>164</b>	<b>795</b>	<b>2000</b>	<b>A or RJ</b>
<b>Mexico Supersite (ADEQ/BAM)</b>	<b>80-026-8012</b>	<b>185</b>	<b>832</b>	<b>2100</b>	<b>A or RJ</b>

\* EPA Air Quality System Identification Number

\*\* 24-hr PM<sub>10</sub> concentration influenced by natural or exceptional event to be flagged.

Type Abbreviations: BAM – Beta-Attenuation Mass Monitor (Continuous monitor)

The preliminary findings from this analysis were presented at a stakeholders meeting in Yuma on November 13, 2007, and were made available for public review during a comment period that ended November 30, 2007. During that time, no comments were received from the public. ADEQ presented and discussed a draft final demonstration

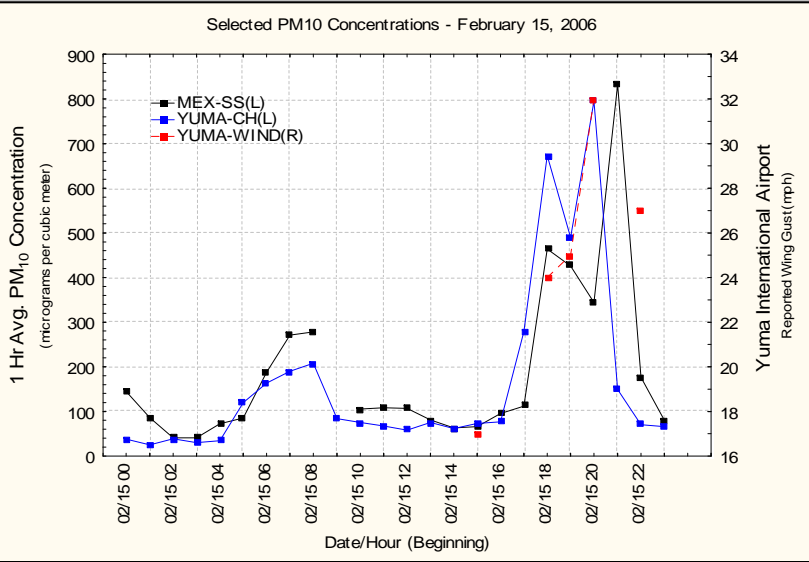
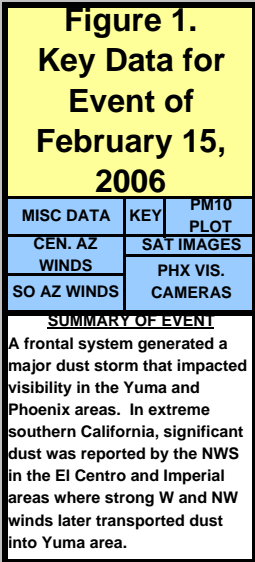
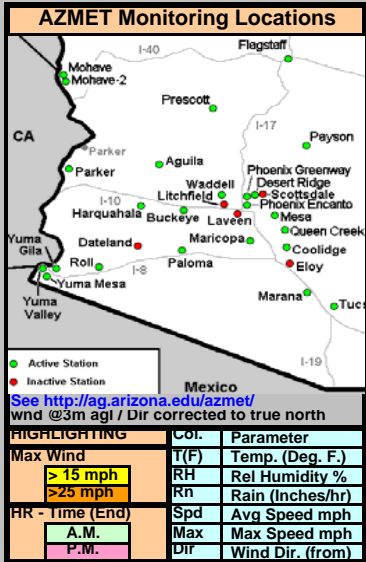
at a stakeholder meeting on May 28, 2008. ADEQ has finalized this demonstration, which was made available for public comment from August 11, 2008, through September 10, 2008. Any comments that were received were forwarded to EPA with this demonstration pursuant to 40 CFR 51.14(c)(3)(i).

NWS-EI Centro, CA							
	Hr	T(F)	VR	Dust	Spd	Gust	Dir
	1	M	M		M	M	M
	2	M	M		M	M	M
	3	M	M		M	M	M
	4	M	M		M	M	M
	5	M	M		M	M	M
	6	61	M		18	29	W
	7	61	M		16	24	W
	8	64	M		24	31	SW
	9	66	M		24	37	SW
	10	69	M	BLDU	30	37	W
	11	71	M	BLDU	30	35	W
	12	72	M	BLDU	32	42	SW
	1	69	M	DU	M	M	M
	2	69	1	BLDU	39s	42	W
	3	70	3	BLDU	32	41	SW
	4	67	2	BLDU	40	49	SW
	5	63	2	BLDU	34	43	SW
	6	62	3	BLDU	41	47	SW
	7	61	4	BLDU	34	45	W
	8	58	4	BLDU	26	38	W
	9	54	5	BLDU	23	29	W
	10	53	5	BLDU	30	33	W
	11	53	5	BLDU	24	31	W
	12	M	M	M	M	M	M

NWS-Imperial, CA							
	Hr	T(F)	VR	Dust	Spd	Gust	Dir
	1	63	10		15	22	NW
	2	61	6	HZ	10	10	N
	3	61	9		19	26	NW
	4	59	10		17	17	NW
	5	59	10		10	10	W
	6	57	10		16	16	W
	7	61	10		11	11	NW
	8	63	10		14	14	W
	9	67	6	HZ	25	32	W
	10	70	10		21	27	W
	11	70	10		22	31	W
	12	72	3	HZ	31	38	W
	1	72	3	HZ	32	41	W
	2	72	3	HZ	33	39	W
	3	72	5	HZ	31	40	W
	4	68	2	HZ	39	47	W
	5	63	1	HZ	41	50	W
	6	59	7		35	45	W
	7	57	10		27	37	W
	8	55	10		25	33	W
	9	54	10		26	31	W
	10	54	10		26	31	W
	11	52	10		21	21	W
	12	52	10		17	17	W

NWS-YUMA INTL APT							
	Hr	T(F)	VR	Dust	Spd	Gust	Dir
	1	58	7		4	4	S
	2	55	7		0	0	N
	3	52	7		0	0	N
	4	55	7		3	3	VR
	5	54	7		3	3	S
	6	57	7		0	0	N
	7	54	7		4	4	SE
	8	54	7		4	4	SE
	9	58	7		0	0	N
	10	60	7		6	6	W
	11	63	7		8	8	W
	12	66	7		9	9	W
	1	70	7		9	9	SW
	2	72	7		11	11	W
	3	72	7		10	17	W
	4	74	7		11	11	W
	5	73	7		14	14	W
	6	M	M	M	M	M	M
	7	66	4	DU	18	24	NW
	8	62	4	BLDU	21	25	NW
	9	59	6	BLDU	21	32	NW
	10	55	6	BLDU	19	19	W
	11	54	6	BLDU	21	27	NW
	12	54	7		18	18	NW

Event Contrib. Analysis				
Hourly PM <sub>10</sub> Conc. (µg/m <sup>3</sup> )				
MONITORS:		Hr	1	2
1-YUMA-CH		1	38	145
2-MEX-SS		2	25	86
		3	39	41
		4	30	41
		5	34	72
24-Hr. Avg PM <sub>10</sub>		6	120	85
		7	163	188
Monitor: with I/w/o		8	190	271
1-YUMA-CH		9	208	278
2-MEX-SS		10	84	
> NAAQS		11	75	105
Pink=Event Contrib.		12	67	108
Conclusion: As shown above, the PM <sub>10</sub> concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).				
	1	58	107	
	2	75	81	
	3	62	63	
	4	73	66	
	5	77	95	
	6	279	112	
	7	673	464	
	8	490	426	
	9	795	344	
	10	149	832	
	11	70	176	
	12	66	80	

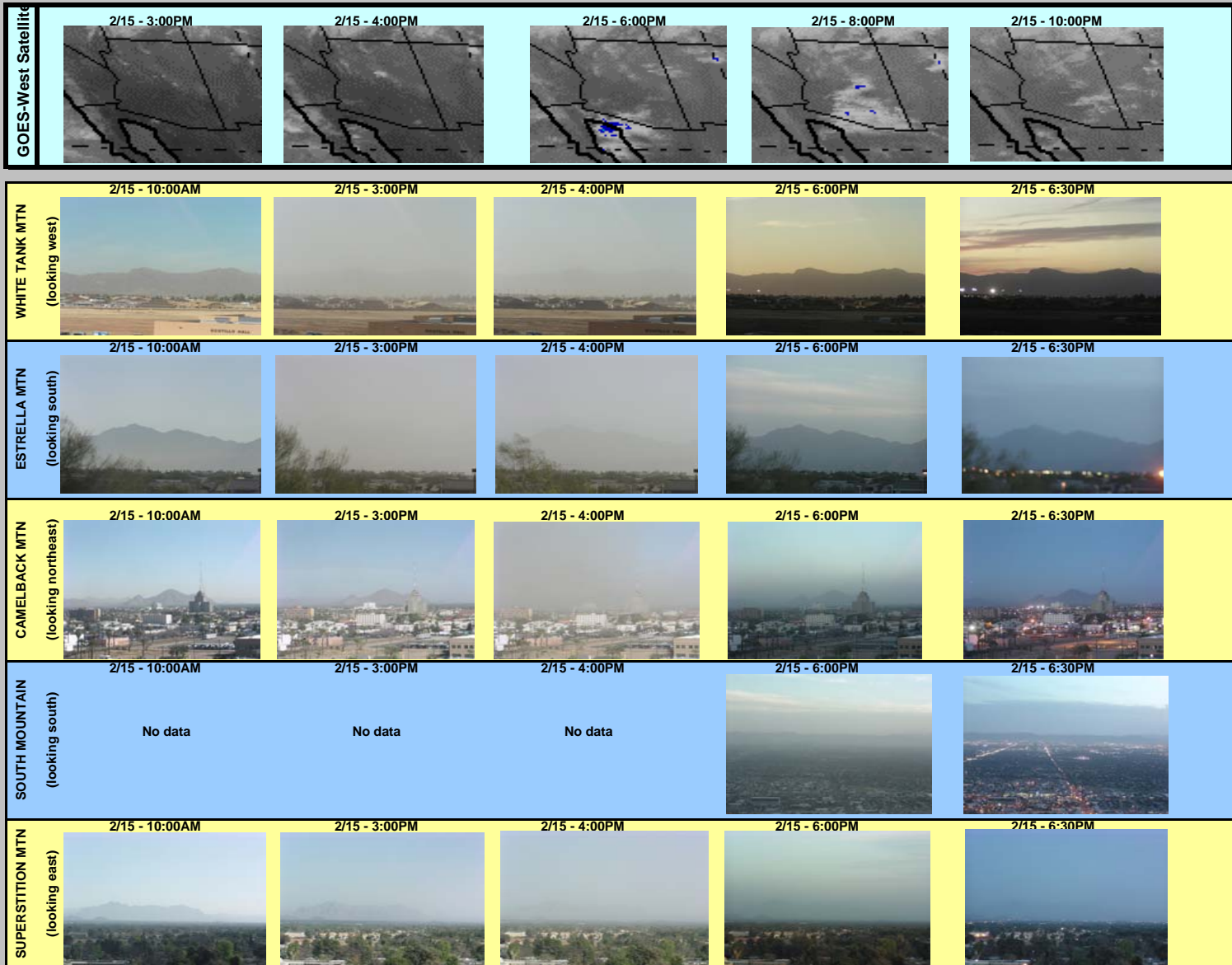


PARKER							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
	1	62	29	-	11	18	S
	2	59	31	-	12	19	S
	3	60	31	-	13	25	S
	4	60	32	-	13	20	S
	5	60	31	-	14	23	S
	6	57	41	-	14	23	S
	7	52	58	-	10	17	S
	8	50	66	-	10	13	SW
	9	55	59	-	12	19	S
	10	60	52	-	20	29	SW
	11	63	50	-	21	27	S
	12	65	44	-	22	30	SW
	1	68	39	-	22	29	SW
	2	70	34	-	20	29	SW
	3	71	31	-	21	28	SW
	4	71	31	-	18	28	SW
	5	70	31	-	15	22	SW
	6	67	33	-	14	22	SW
	7	63	40	-	12	21	S
	8	60	41	-	12	17	SW
	9	58	41	-	11	19	SW
	10	60	28	-	18	27	NW
	11	57	26	-	15	25	NW
	12	55	23	-	13	20	NW

MARICOPA							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
	1	54	16	-	9	6	SE
	2	51	19	-	2	5	E
	3	50	20	-	5	10	S
	4	49	22	-	6	8	S
	5	49	25	-	5	7	S
	6	49	25	-	6	9	S
	7	50	25	-	7	9	S
	8	51	24	-	10	14	S
	9	56	21	-	8	13	S
	10	64	16	-	9	13	S
	11	69	12	-	7	15	S
	12	73	10	-	9	18	W
	1	73	10	-	8	13	NW
	2	75	10	-	7	15	W
	3	77	11	-	9	19	W
	4	77	11	-	15	23	W
	5	76	12	-	14	22	W
	6	74	12	-	13	20	SW
	7	69	13	-	8	14	SW
	8	65	18	-	7	31	S
	9	66	22	-	12	22	SW
	10	63	28	-	11	17	SW
	11	60	34	-	7	14	SW
	12	56	43	-	4	9	SE

COOLIDGE							
	Hr	T(F)	RH	Rn	Spd	Max	Dir
	1	47	29	-	2	5	SE
	2	42	40	-	4	7	SE
	3	41	43	-	4	8	S
	4	48	27	-	6	8	S
	5	46	31	-	3	6	SE
	6	42	36	-	3	6	SE
	7	41	41	-	5	7	SE
	8	40	47	-	4	8	S
	9	51	39	-	4	8	E
	10	58	31	-	2	5	E
	11	67	20	-	7	16	SW
	12	71	16	-	14	21	SW
	1	73	15	-	15	24	SW
	2	74	15	-	15	25	SW
	3	75	14	-	17	26	SW
	4	74	14	-	18	27	SW
	5	73	14	-	17	24	SW
	6	71	15	-	16	24	SW
	7	67	18	-	16	24	SW
	8	65	26	-	16	26	SW
	9	62	32	-	10	19	SW
	10	59	41	-	7	11	SW
	11	58	45	-	9	15	SW
	12	55	50	-	6	9	SW

Historical Distribution				
5-Yr. Dist. of Values (µg/m <sup>3</sup> )				
MONITORS:		Column Index		
1-YUMA-CH		Yr - All Data (5-Yrs)		
2-MEX-SS		Sea - Data for WINTER season only (5-Yrs)		
Cum. Freq.		Mon 1	Mon 2	
Min		8	10	13
0.5%		12	12	29
1.0%		14	13	35
2.5%		16	14	46
5%		19	17	54
10%		23	20	62
25%		31	28	79
50%		42	35	104
75%		57	50	149
90%		77	70	206
95%		96	86	247
97.5%		127	107	290
99.0%		186	168	318
99.5%		211	181	351
Max		349	186	446
Flagged Value		164	185	
Conclusion: Flagged Value is exceptional in nature (eg. greater than 95% of all data)				



## Assessment Under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. Data from the Yuma Supersite monitor operated by ADEQ was found to be invalid due to frequent power outages that occurred during the initial monitoring period which began one week prior to this significant wind event. Valid data collection at the Yuma Supersite began February 20<sup>th</sup> 2006. All hourly PM<sub>10</sub> readings from Yuma Courthouse and Mexico Supersite were valid for February 15<sup>th</sup>, with the exception of one hour from the Mexico Supersite that was invalid due to a brief power failure. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode.

2. Review suspected contributing sources. The AzMET and NWS surface data from the Phoenix metro area and southwestern Arizona / southeast California provide a good explanation of the meteorological conditions that were in place throughout the day of February 15<sup>th</sup>. Strong winds allowed for dry and loose soils to be easily picked up and transported. This transport is evident in the visibility camera images for the Phoenix metro area. While air quality typically improves during the afternoon hours as mixing heights increase, it can be clearly seen that visibility across the Phoenix metro area severely degraded during this time as winds increased. While no such visibility network exists for the Yuma area, such images can be inferred by comparing the meteorological data from Yuma, Phoenix, and southeast CA. Additionally, blowing dust reports from multiple NWS stations throughout southwest Arizona and southeast California, included in the upper left portion of Figure 1, are proof that strong winds picked up and transported dust and soils. The plot of hourly PM<sub>10</sub> concentration data in the upper right corner of Figure 1, in conjunction with the wind data, confirms the identical timing of the wind and elevated PM<sub>10</sub> concentrations. Finally, blowing dust and reduced visibilities reported at the Yuma MCAS were coincident with elevated PM<sub>10</sub> concentrations measured at both flagged sites.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the Yuma area are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the “Historical Distribution” Table in Figure 1 has been included to demonstrate that the event is associated with measured concentrations in excess of

normal historical fluctuations, including background (i.e., concentrations greater than the 95<sup>th</sup> percentile). All properly functioning monitors in the Yuma area exceeded the NAAQS, which suggests a regional component to the event.

4. Examine the meteorological conditions before and during the event. The AzMET meteorological data are summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. The event can be divided into two separate phenomena: (1) strong prefrontal SW winds occurring northeast of the Yuma area and (2) strong WNW winds associated with the frontal boundary that moved through the Yuma area later in the evening. Blowing dust in areas east of Yuma was attributed to prefrontal SW winds, while blowing dust in Yuma and southeast California was attributed to WNW winds associated with the passage of the frontal boundary.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM<sub>10</sub> concentrations in the Yuma area can be attributed to soil emissions in the area north and west of Yuma that were transported over a broad area. No source-specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the major wind-blown dust event for the evening episode. Observational reports of haze and blowing dust from trained officials is further proof that the elevated PM<sub>10</sub> concentrations were attributed to soil emissions.

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over a wide geographic region for which there no effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the “Event Contrib. Analysis” Table in Figure 1 has been included to demonstrate that there would have been no exceedances or violations but for the event (i.e., the contribution during the event overwhelmed the 24-hour averages).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentrations at both Yuma Courthouse and Mexico Supersite were attributed to a natural event.

## Conclusion

Long-range transport of dust from soils. The regional wide elevated PM<sub>10</sub> event on February 15, 2006, in Yuma and Maricopa County was a result of long-range transport of dust and soils from high winds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be flagged for air quality

planning purposes. The “high wind” flag (A or RJ) should be applied to the monitor readings indicated in the summary table at the beginning of this report, as monitors would have been below the NAAQS but for the contribution of the event.





**MARICOPA COUNTY**  
**DUST CONTROL ACTION FORECAST**  
ISSUED MONDAY, FEB 13, 2006  
Three-day weather outlook:

The air mass over the forecast area is expected to remain stagnant enough thru midday Tuesday to warrant a HIGH risk of unhealthy PM-10 levels. Then on Wednesday gradients and winds aloft are forecast to increase over the valley as a strong weather disturbance passes by to the north. Wind gusts as high as 30 mph may mix down to the surface by afternoon with a potential for areas of blowing dust; thus the HIGH risk will be retained. Lighter winds and minimal stagnation should warrant a LOW risk on Thursday.

**RISK FACTORS**

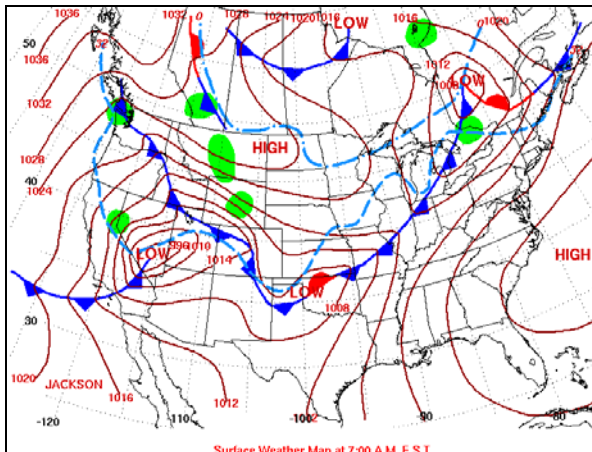
	<u>WINDS</u>	<u>STAGNATION</u>	<u>RISK LEVEL</u>
Day #1: Tue 02/14/2006	Becoming south to southwesterly 5-15 mph by afternoon.	Quite stagnant during the morning hours with some improvement by afternoon.	<b>HIGH</b>
Day #2: Wed 02/15/2006	Becoming south to southwesterly 15-25 with higher gusts by afternoon.	No stagnation is expected.	<b>HIGH</b>
Day #3: Thu 02/16/2006	Southwest to westerly 10-20 mph by afternoon.	No significant stagnation is expected.	<b>LOW</b>

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. To review the complete air quality forecast for the Phoenix metropolitan area and the health effects of air pollution, please see ADEQ's Air Quality Forecast at <http://www.azdeq.gov/enviro/air/ozone/ensemble.pdf>, or call 602-771-2367 for recorded forecast information.

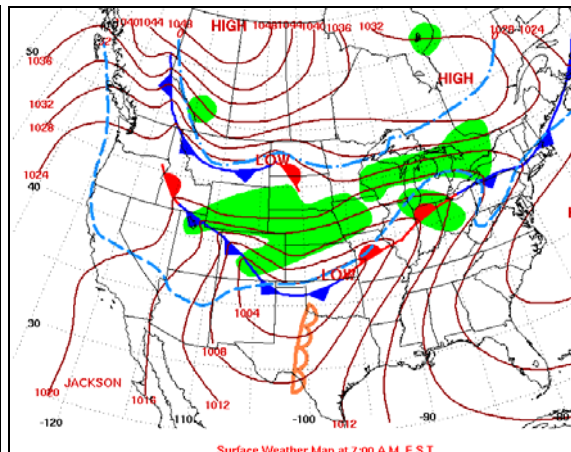
# Weather Charts for February 15-16, 2006

## Surface Analysis

02/15 - 12z

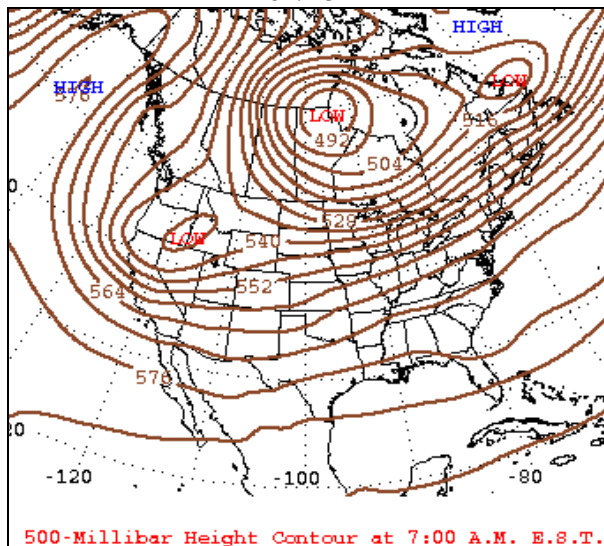


02/16 - 12z

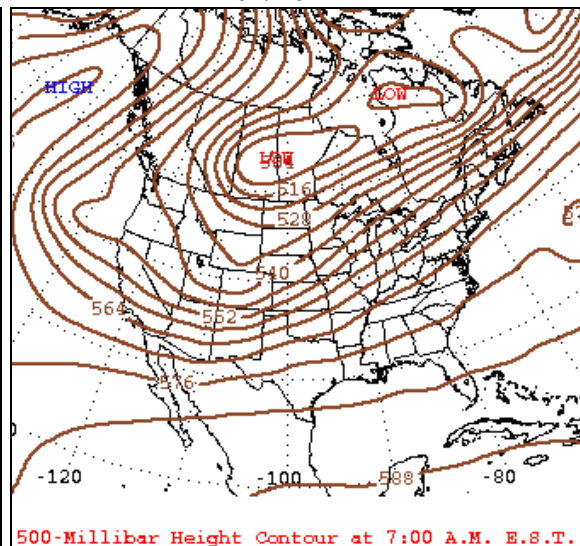


## 500mb Chart

02/15 - 12z



02/16 - 12z



U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
IMPERIAL COUNTY AIRPORT (03144)  
IMPERIAL , CA  
(02/2006)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -59 ft. below sea level  
Latitude: 32.834  
Longitude: -115.579  
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
15	0053	12	CLR	10.00	HZ	63	17.0	49	9.5	34	1.0	34	15	310	22	29.87			M	AA		29.81
15	0153	12	CLR	6.00		61	16.0	48	9.0	34	1.0	36	10	340		29.87			M	AA		29.81
15	0253	12	CLR	9.00		61	16.0	49	9.6	37	3.0	41	19	300	26	29.88			M	AA		29.82
15	0353	12	CLR	10.00		59	15.0	49	9.5	39	4.0	48	17	300		29.88			M	AA		29.82
15	0453	12	CLR	10.00		59	15.0	49	9.5	39	4.0	48	10	290		29.89			M	AA		29.83
15	0553	12	CLR	10.00		57	14.0	48	9.0	39	4.0	51	16	270		29.89			M	AA		29.83
15	0653	12	CLR	10.00	HZ	61	16.0	50	10.1	39	4.0	44	11	300		29.92			M	AA		29.86
15	0753	12	CLR	10.00		63	17.0	51	10.6	39	4.0	41	14	260		29.94			M	AA		29.88
15	0853	12	CLR	6.00		67	19.4	53	11.3	38	3.3	35	25	250	32	29.93			29.86	AA		29.87
15	0953	12	CLR	10.00		70	21.0	54	12.3	39	4.0	32	21	260	27	29.94			M	AA		29.88
15	1053	12	CLR	10.00		70	21.0	53	11.9	37	3.0	30	22	260	31	29.93			M	AA		29.87
15	1153	12	CLR	3.00		72	22.0	55	12.7	39	4.0	30	31	260	38	29.89			M	AA		29.83
15	1200	12	FEW004	2.00		72	22.0	55	12.7	39	4.0	30	30	250	38	29.89			M	SP		29.83
15	1204	12	FEW004	1.25		72	22.0	55	12.7	39	4.0	30	34	250	40	29.88			M	SP		29.82
15	1217	12	FEW002	2.00		72	22.0	55	12.7	39	4.0	30	34	260	40	29.88			M	SP		29.82
15	1226	12	FEW002	4.00		72	22.0	55	12.7	39	4.0	30	34	250	41	29.88			M	SP		29.82
15	1253	12	CLR	2.50		72	22.0	54	12.3	37	3.0	28	32	260	41	29.87			M	AA		29.81
15	1303	12	CLR	3.00		72	22.0	54	12.3	37	3.0	28	32	250	42	29.86			M	SP		29.80
15	1353	12	FEW026	3.00		72	22.0	54	12.3	37	3.0	28	33	260	39	29.85			M	AA		29.79
15	1405	12	FEW023	2.50		72	22.0	54	12.3	37	3.0	28	32	250	41	29.84			M	SP		29.78
15	1420	12	FEW009	2.50		72	22.0	54	12.1	36	2.0	27	35	250	41	29.85			M	SP		29.79
15	1428	12	CLR	3.00		72	22.0	54	12.3	37	3.0	28	29	250	41	29.85			M	SP		29.79
15	1453	12	CLR	5.00		72	22.0	54	12.1	36	2.0	27	31	260	40	29.85			M	AA		29.79
15	1528	12	CLR	2.50		70	21.0	53	11.7	36	2.0	29	33	260	42	29.85			M	SP		29.79
15	1541	12	CLR	3.00		68	20.0	52	11.2	36	2.0	31	35	260	43	29.85			M	SP		29.79
15	1553	12	CLR	2.00		68	20.0	53	11.4	37	3.0	32	39	260	47	29.85			M	AA		29.79
15	1558	12	CLR	1.25		66	19.0	52	10.9	37	3.0	34	35	260	47	29.86			M	SP		29.80
15	1605	12	CLR	2.00		66	19.0	52	10.9	37	3.0	34	35	260	45	29.86			M	SP		29.80
15	1623	12	FEW001	1.25		64	18.0	51	10.4	37	3.0	37	38	260	48	29.86			M	SP		29.80
15	1644	12	FEW001	1.50		64	18.0	50	10.2	36	2.0	36	41	260	49	29.87			M	SP		29.81
15	1653	12	FEW001	1.25		63	17.0	50	9.9	36	2.0	37	41	260	50	29.88			M	AA		29.82
15	1701	12	CLR	1.75		63	17.0	50	9.9	36	2.0	37	36	260	50	29.89			M	SP		29.83
15	1708	12	CLR	3.00		63	17.0	50	9.9	36	2.0	37	35	260	45	29.88			M	SP		29.82
15	1753	12	CLR	7.00		59	15.0	48	8.9	36	2.0	42	35	260	45	29.90			2	026	M	AA
15	1853	12	CLR	10.00	57	13.9	46	7.8	33	0.6	40	27	270	37	29.93	M	AA				29.87	
15	1953	12	CLR	10.00	55	13.0	45	7.0	32	0.0	42	25	270	33	29.93	M	AA				29.87	
15	2053	12	CLR	10.00	54	12.0	44	6.4	30	-1.0	40	26	270	31	29.96	M	AA				29.90	
15	2153	12	CLR	10.00	54	12.0	44	6.4	30	-1.0	40	26	270	31	29.99	M	AA				29.93	
15	2253	12	CLR	10.00	52	11.0	43	6.2	32	0.0	47	21	260		30.02	M	AA				29.96	
15	2353	12	CLR	10.00	52	11.0	43	6.2	32	0.0	47	17	270		30.03		M	AA		29.97		

*Dynamically generated Tue Sep 04 16:07:53 EDT 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>*

U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

**HOURLY OBSERVATIONS TABLE  
YUMA MARINE CORPS AIR STATION/YUMA INTL  
AIRPORT (23195)  
YUMA , AZ  
(02/2006)**

Elevation: 0 ft. above sea level

Latitude: 32.657

Longitude: -114.606

Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
15	0056	0	CLR	7.00		58	14.4	45	6.9	27	-2.8	31	4	170		29.58			29.80	AA		29.81
15	0156	0	CLR	7.00		55	13.0	44	6.6	30	-1.0	39	0	000		29.59			M	AA		29.82
15	0256	0	CLR	7.00		52	11.1	42	5.6	29	-1.7	41	0	000		29.59			29.81	AA		29.82
15	0356	0	CLR	7.00		55	12.8	46	7.6	35	1.7	47	3	VR		29.62			29.83	AA		29.85
15	0456	0	CLR	7.00		54	12.2	45	7.1	34	1.1	47	3	180		29.63	3	014	29.84	AA		29.86
15	0556	0	CLR	7.00		57	14.0	47	8.6	37	3.0	47	0	000		29.63			M	AA		29.86
15	0656	0	CLR	7.00		54	12.0	47	8.2	39	4.0	57	4	120		29.62			M	AA		29.85
15	0756	0	CLR	7.00		54	12.0	47	8.2	39	4.0	57	4	140		29.62			M	AA		29.85
15	0856	0	CLR	7.00		58	14.4	49	9.5	40	4.4	51	0	000		29.66			29.88	AA		29.89
15	0956	0	FEW200	7.00		60	15.6	50	10.0	40	4.4	48	6	250		29.67			29.89	AA		29.90
15	1056	0	FEW200	7.00		63	17.2	52	11.0	41	5.0	45	8	250		29.67	0	014	29.89	AA		29.90
15	1156	0	FEW200	7.00		66	18.9	53	11.5	40	4.4	39	9	280		29.66			29.88	AA		29.89
15	1256	0	FEW200	7.00		70	21.0	53	11.8	37	3.0	30	9	240		29.63			M	AA		29.86
15	1356	0	FEW200	7.00		72	22.2	53	11.7	34	1.1	25	11	260		29.60	8	020	29.82	AA		29.83
15	1456	0	FEW200	7.00		72	22.2	53	11.5	33	0.6	24	10	250	17	29.57			29.79	AA		29.80
15	1556	0	FEW200	7.00		74	23.3	54	12.4	35	1.7	24	11	260		29.56			29.78	AA		29.79
15	1656	0	SCT200	7.00		73	22.8	M	M	34	1.1	M	14	270		M	6	017	29.78	AA		M
15	1856	0	SCT200	4.00	DU	66	19.0	50	9.9	32	0.0	28	18	310	24	29.58			M	AA		29.81
15	1956	0	SCT200	4.00	BLDU	62	16.7	48	8.9	32	0.0	32	21	320	25	29.62	3	020	29.84	AA		29.85
15	2056	0	SCT200	6.00	BLDU	59	15.0	46	7.7	30	-1.0	33	21	300	32	29.61			M	AA		29.84
15	2156	0	FEW200	6.00	BLDU	55	12.8	44	6.8	31	-0.5	40	19	290		29.63			29.85	AA		29.86
15	2256	0	CLR	6.00	BLDU	54	12.2	43	6.2	29	-1.7	38	21	300	27	29.66	3	017	29.88	AA		29.89
15	2356	0	CLR	7.00		54	12.0	43	6.0	28	-2.0	37	18	330		29.71			M	AA		29.94

Dynamically generated Wed Aug 22 16:39:15 EDT 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>



U.S. Department of Commerce  
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL  
CLIMATOLOGICAL DATA  
(final)  
HOURLY OBSERVATIONS TABLE  
NAF (23199)  
EL CENTRO , CA  
(02/2006)**

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801

Elevation: -43 ft. below sea level  
Latitude: 32.817  
Longitude: -115.667  
Data Version: VER3

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti- meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
15	0555	5	CLR	M		61	16.1	51	10.3	40	4.4	46	18	270	29	29.86			29.82	AA		29.82
15	0655	5	FEW060	M		61	16.1	51	10.3	40	4.4	46	16	280	24	29.88	1	007	29.84	AA		29.84
15	0755	5	FEW060 FEW100	M		64	17.8	52	10.8	39	3.9	40	24	240	31	29.91			29.87	AA		29.87
15	0855	5	FEW060 SCT100	M		66	18.9	52	11.3	39	3.9	37	24	240	37	29.92			29.88	AA		29.88
15	0955	5	FEW060 SCT150	M	BLDU	69	20.6	54	12.2	40	4.4	35	30	250	37	29.93	2	017	29.89	AA		29.89
15	1055	5	FEW060 SCT150	M	BLDU	71	21.7	55	12.7	40	4.4	33	30	250	35	29.93			29.89	AA		29.89
15	1137	5	FEW060 SCT150	M	BLDU	72	22.0	55	12.7	39	4.0	30	31	240	40	29.92			29.88	SP		29.88
15	1155	5	FEW060 SCT150	M	BLDU	72	22.2	55	12.9	40	4.4	31	32	240	42	29.91			29.87	AA		29.87
15	1255	5	FEW060 FEW150	M	DU	69	20.7	54	12.2	40	4.4	35	M	M		29.89	7	014	29.85	AA		29.85
15	1355	5	FEW060 FEW150	1.00	BLDU	69	20.7	54	12.2	40	4.4	35	39s	250	42	29.86			29.82	AA		29.82
15	1455	5	FEW060 FEW150	3.00	BLDU	70	21.1	53	11.7	36	2.2	29	32	240	41	29.84			29.80	AA		29.80
15	1555	5	FEW060 FEW150	1.50	BLDU	67	19.4	52	11.3	38	3.3	35	40	230	49	29.86	7	010	29.82	AA		29.82
15	1655	5	SCT150	2.00	BLDU	63	17.3	49	9.5	34	1.1	34	34	240	43	29.88			29.84	AA		29.84
15	1755	5	FEW060 SCT150	3.00	BLDU	62	16.4	50	9.7	36	2.3	38	41	240	47	29.90			29.86	AA		29.86
15	1855	5	FEW060 SCT150	4.00	BLDU	61	16.2	48	9.0	34	1.1	36	34	250	45	29.92	2	020	29.88	AA		29.88
15	1955	5	CLR	4.00	BLDU	58	14.4	46	7.5	30	-1.1	35	26	260	38	29.93			29.89	AA		29.89
15	2055	5	CLR	5.00	BLDU	54	12.2	44	6.4	30	-1.1	40	23	250	29	29.96			29.92	AA		29.92
15	2155	5	CLR	5.00	BLDU	53	11.7	43	6.3	31	-0.5	43	30	250	33	29.98	2	020	29.94	AA		29.94
15	2255	5	FEW150	5.00	BLDU	53	11.7	44	6.5	32	0.0	45	24	250	31	30.00			29.96	AA		29.96

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